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Improved crop health and  
reduced irrigation system  
maintenance for a vegetable  
farm in the Almeria region,  
Spain

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### What is the HPGen solution?

With HPGen, water treatment can be implemented in a simple and efficient way. HPGen A series is designed specifically for the agriculture market and integrates seamlessly with standard irrigation systems. HPGen produces a safe concentration of a peroxide-based oxidizer solution. This powerful solution is injected into irrigation lines, where it keeps emitters flowing and enriches the water with oxygen. This ensures an optimal irrigation uniformity, increased nutrient availability and higher yields.



#### Key benefits / characteristics

- 💧 On-site generation of powerful, high-purity peroxide-based solution
- 💧 Chemical-input free - Only water, electricity and air as inputs
- 💧 > 99.99 % purity Hydrogen Peroxide, no additives
- 💧 Autonomous – fully automated operation
- 💧 Cost effective – saves chemicals, storage, handling and labor
- 💧 Eco friendly – HPGen solution breaks down to pure water and oxygen

### Site details

Positioned in the highly productive greenhouse area in the Almeria region in southern Spain, this grower focuses on melons and cucumbers. The soil in the region is dry, the climate warm and the operators use organic fertilizers. The plants are grown directly in the soil in a plastic covered greenhouse and are irrigated with a modern drip irrigation system using pressure compensating non-leakage drippers. When assessing the site, it was clear that clogging of drippers leads to non-uniform irrigation and insufficient water and fertilizer delivery to part of the crop. At the same time poor dissolution of organic fertilizer in the irrigation water leads to poor soil quality and exacerbates clogging.

To overcome these issues, an HPGen A500 model was installed and integrated with the irrigation system.

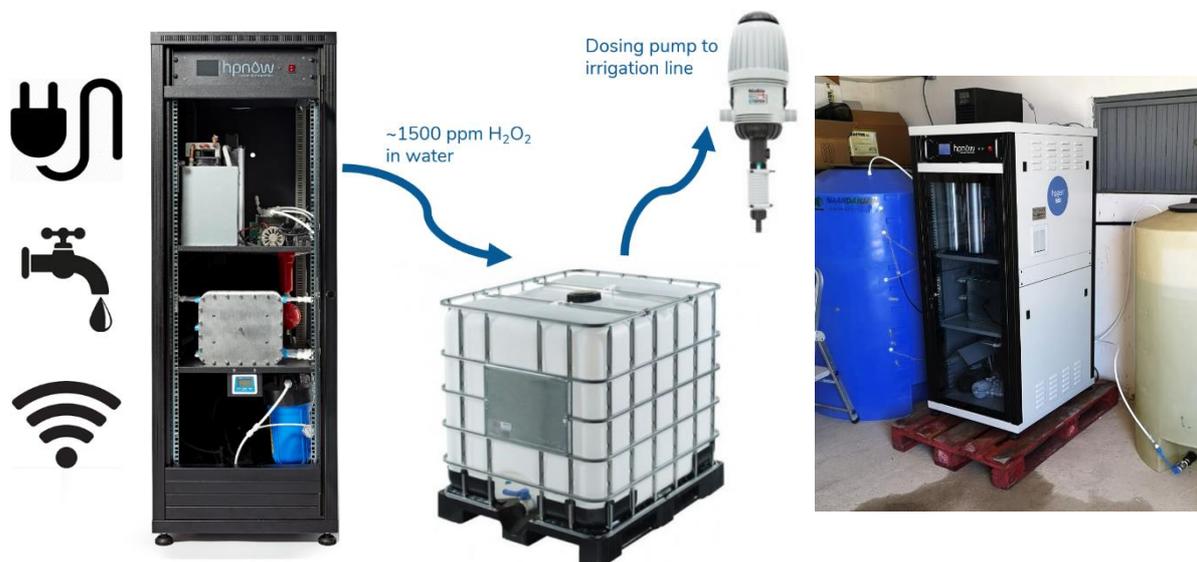


## HPGen setup and dosing

The HPGen A500 was installed in the irrigation room and set to operate automatically with a reservoir. Prior to installation, the drippers were analyzed, and a large proportion were clearly clogged, meaning little to no water was coming through them. To overcome this, the farm personnel were going through the drippers frequently to “unclog”, a manual process highly costly in man-hours.

Soil quality was also analyzed and the amount of organic matter in the soil, a critical parameter for the healthy growth of the plants, was very low at 0.33%.

Dosing: The HPGen was set to produce a 0.15% Hydrogen Peroxide solution in a buffer tank which was then diluted in-line for the irrigation water.

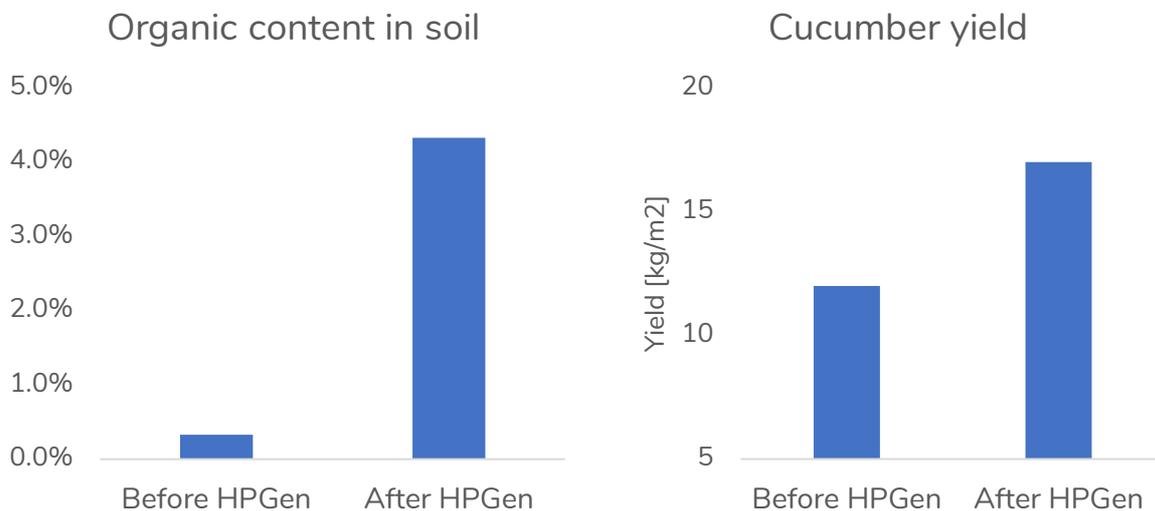


## Results of HPGen treatment

After just six months of running with the HPGen, soil quality was analyzed once more and found to be greatly improved. The results indicated more than ten-fold improvement in organic matter. At the same time, the drippers now exhibited no clogging. See images below of dripper before and after using HPGen:



The benefits are clear, a more efficient irrigation system where maintenance of the drip lines has been eliminated and delivery of fertilizer optimized. The plants from the treated section could be directly compared to a section without treatment, where all other parameters were kept the same as the section treated with HPGen.



Even more important than the increase in organic material in the soil, it was clear that the yield had improved by more than 40% compared to before working with HPGen. In conclusion, HPGen was able to solve the key issues in irrigation that the grower was dealing with. It eliminated dripper clogging, improved fertilizer delivery to the plants and as a result increased the yield substantially.